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ABSTRACT

This document contains the annual report for Year 7 of the Southeastern University and College Coalition for Engineering Education (SUCCEED). It features an Executive Summary, a response to recommendations of prior review teams, a description of major accomplishments, future plans, an evaluation, and reports on dissemination, industrial involvement, evidence of culture changes, infrastructure, value added by the coalition, and the program budget. Enrollment and degree statistics are also included. Project SUCCEED members include Clemson University, Florida A&M University, Florida State University, Georgia Institute of Technology, North Carolina A&T State University, North Carolina State University, University of Florida, University of North Carolina at Charlotte, and Virginia Polytechnic Institute and State University. (WRM)

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SUCCEED

SOUTHEASTERN UNIVERSITY AND COLLEGE COALITION FOR ENGINEERING EDUCATION

Annual Report
Year 7

June 1999

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An NSF Engineering Education Coalition

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C. Major Accomplishments

SUCCEED has had another very successful year, yielding a wide range of accomplishments across all of our functional teams. These accomplishments include the

Virtual Corporations; Hands-on Workshop Statics; Infrastructure Assessment and Rehabilitation Design; Integrated Building Design; Workplace Transitioning; Mechatronics Education; Biological Systems Engineering; Introductory Engineering Lab; and Early Engineering Design.

A complete cycle of 2-3 day qualitative evaluation site visits to all eight campuses to assess organization, operation and progress has been completed in the past two years.

Georgia Tech's nationally recognized CHALLENGE program was broadened to include all student groups and the Summer Freshmen transition program was redesigned to be a yearlong program. A Dual Degree transition program was also established. At GT, students complete 2 or 3 years of degree requirements at a designated partner college and transfer to GT to complete their engineering degree. At the end, they get two bachelor's degrees, one from their primary institution and one from GT.

The ST CFT initiated a project to increase retention at the critical "gateway" courses at the sophomore level when students enter their major discipline and where the retention is typically 50% or less. Retention improved to 90% with the incorporation of web-supplemented instruction and ST Best Practices.

The FAMU-FSU Campus Implementation Team (CIT) has formed an important partnership with the College Curriculum Committee—the two groups worked jointly to spearhead a review of all BS degree programs, and the CIT developed templates for the assessment of degree programs that will be used as a model by all programs.

The updated Longitudinal Database (LDB) was used to study to graduation percentage by institution and engineering discipline and to study second year retention by gender. The Coalition-wide Student Climate Study completed in 1997 has been published and distributed.

At North Carolina A&T, 20% of the engineering faculty have attended teaching improvement workshops in just the past year, and the College of Engineering obtained industry support for a summer bridge program, a professional development workshop series, and a teacher intern program.

A report by the Assessment & Evaluation team summarizing the results and conclusions of the first three product dissemination case studies has been published and distributed. A report of the second set of three studies is now in progress.

NC State implemented a new Introduction to Engineering Problem Solving course including a laboratory component for all new freshmen engineers (1134 students) and introduced the use of undergraduate student leaders as mentors in all Introduction to Engineering laboratories.

UF's FD efforts have been institutionalized in the form of a new College-wide Faculty Orientation Program designed and implemented by SUCCEED.

The longitudinal study of women and minority undergraduate engineering enrollment and BS degrees awarded by SUCCEED has been updated using the national statistics published by the American Association of Engineering Societies. Compared with non-SUCCEED schools in the United States, SUCCEED has greater growth in all categories of enrollment and greater percentages of total enrollment in every category with the exception of percentage of total enrollment of Hispanic and Native American students. These figures include adjustments for changes in total enrollment.

Clemson's Multidisciplinary Design program was extended beyond Mechanical and Chemical Engineering to include Industrial Engineering and Ceramic Engineering, and new industrial sponsors were added. Clemson also overhauled the first year sequence of courses in engineering (ENGR 101 and 120) by importing SUCCEED materials and introducing more hands-on engineering content.

Workshops, conferences, and seminars

It has always been clear that the funding the NSF provides to SUCCEED is a catalyst—that NSF funding alone will not provide sufficient resources to cause the desired reform. As a result, many of our Principal Investigators (PIs) from the first five years and those who are members of SUCCEED teams devote considerable amounts of their time sharing our vision and innovations and learning about the innovations of others. The table below lists as concisely as possible the wide variety of ways we are aiding faculty development in SUCCEED and at other institutions. These are in generally in chronological order, including a few future dates. Note that certain campuses are not used as frequently for Coalition-wide events—this is due to the significantly higher cost associated with traveling to some of our institutions.

Event description	Date of event	Location (see acronym list)	Number attending	Attendee population (see acronym list)
Council of Schools visit	6/5/98	UCF	31	SUCCEED / COS
National Eff. Teaching Inst.	6/25-27/98	Seattle, WA	50	US Faculty
ASEE Annual Conference and Exhibition	6/28-7/1/98	Seattle, WA		SUCCEED delegation
Gateway Workshop on Engineering Writing	7/20/98	University of South Carolina	25	SUCCEED delegation
Effective Teaching Refresher Workshop	8/13/98	NC State	27	Local campus
New Engr. Fac. Orientation	8/20/98	UF	25	Local campus
Council of Schools visit	9/2/98	MSU	23	SUCCEED / COS
Distance Education Wkshp.	9/15/98	UNCC	13	Local campus
TBCD Campus Workshop	9/30/98	NCAT	10	Local campus
Active Learning Env. for Engineering Education	9/30/98	VT	53	CEUT-SUCCEED Learning community
Orientation to Teaching for Grad. Students/New Fac.	10/2/98	NC State	54	SUCCEED / COS

Event description	Date of event	Location (see acronym list)	Number attending	Attendee population (see acronym list)
Cross-Coalition Meeting	10/15/98		17	SUCCEED/Coalitions
TBCD Campus Workshop	10/21/98	NCAT	10	Local campus
Effective Teaching Wkshop.	10/22/98	FAMU-FSU	63	SUCCEED / COS
Council of Schools visit	10/25-26/98	MTU	20	SUCCEED / COS
OA Planning Workshop	11/3/98	Alexandria, VA	39	SUCCEED / COS
TBCD Campus Workshop	11/4/98	NCAT	12	Local campus
Why Students Leave Science and Engineering	11/6/98	Clemson	25	Local campus
Assessing Teaching	11/13/98	Clemson	25	Local campus
TBCD Campus Workshop	11/18/98	NCAT	18	Local campus
Engineering Learning Community (ELC) Mtg.	11/19/98	VT	22	Learning community
COE-Teach	11/30/98	NC State	22	Learning community
OA Presentation	12/98	NC State	15	ChE dept. faculty
ELC Meeting	12/4/98	VT	15	Learning community
Effective Web-sites for Teaching and Learning		Va Tech		Local campus
Orientation to Teaching (4-part series)	1998-99	Clemson	13	New CES faculty
COE-Teach	1/25/99	NC State	19	Learning community
UF EXPO Attendance	2/4/99	UF	35	Local campus
Communication Styles	2/4/99	NC State	25	Local campus
Co-op/Internship Best Pract.	2/11/99	Clemson	40	SUCCEED / COS
Eff. Teaching with Tech.	2/19/99	Clemson	57	SUCCEED / COS
Presenting Eff. Tech. Wkshps.	2/20/99	Clemson	22	SUCCEED / COS
COE-Teach	2/22/99	NC State	21	Learning community
Tech. Writing Workshop I	2/25/99	UNCC	17	Local campus
Tech. Writing Workshop II	3/2/99	UNCC	18	Local campus
Council of Schools visit	3/10-11/99	U Louisville	40	SUCCEED / COS
Mentoring Prog. Workshop	3/15/99	Charlotte, NC	53	SUCCEED / COS
Bridge Programs Workshop	3/16/99	Charlotte, NC	21	SUCCEED / COS
Tech. Writing Workshop III	3/18/99	UNCC	6	Local campus
Journeys of Women in Science and Engineering	3/25/99	NC State	32	Local campus
ELC Meeting	3/26/99	VT	24	Learning community
COE-Teach	3/29/99	NC State	17	Learning community
Cross-Coalition Faculty Development Conference	4/6-7/1999	NC State	15	SUCCEED/Coalitions
Women in Academic Careers	4/7/99	NC State	34	SUCCEED / COS
Enhancing Teaching and Learning / 1999 Ann. Mtg.	4/8/99	NC State	135	SUCCEED + COS + invited
ASEE/SE section conference	4/9/99	Clemson		SUCCEED delegation
Faculty Forum on WebCT	4/15/99	Clemson	12	
Council of Schools visit	4/19/99	SJSU	20	SUCCEED / COS
Alcoa "Celebration of Teaching Day"	5/4/99	UNCC	104	Local campus
Technology in the Classroom	5/10/99	GT	45	Local campus
Synchronized Streaming Media workshop	5/28/99	FAMU-FSU	30 estimated	SUCCEED + COS

Event description	Date of event	Location (see acronym list)	Number attending	Attendee population (see acronym list)
Bridging the Communication Gap workshop	6/3-5/99	UF	30 estimated	SUCCEED + COS
National Eff. Teaching Inst.	6/17-19/99	Charlotte, NC	50	US Faculty
ASEE Annual Conference	6/20-23/99	Charlotte, NC		SUCCEED delegation
Best Practices in Curriculum Innovation and Renewal	9/17-18/00	Charlotte, NC		SUCCEED / COS
Active Principal Investigators and partners	Ongoing		493	SUCCEED
Outcomes Assessment Faculty Committee	Ongoing	NCAT	13	Local campus
Faculty Development on the Shoulders of Giants	Ongoing	FAMU-FSU		Local campus
Teaching Leader Network	Ongoing		16	Learning community
Faculty TBCD Interest Grp.	Ongoing	NCAT		Learning community

Products

All SUCCEED's teams have added to their tangible legacy in the past year. The Faculty Development team has expanded efforts to train FD experts on each SUCCEED campus by developing new notebooks including "Effective Teaching with Technology," "Presenting Effective Technology Workshops," and "Mentoring and Supporting New Faculty." At UF, an Excellence in Teaching CD-ROM was developed and piloted in an effort to provide faculty with a tangible reference of teaching techniques in a more compact form. As mentioned earlier, the OA CFT has developed an employer survey instrument of great importance.

Early in the year, the ST CFT produced a workbook including the outcomes of the workshop on multidisciplinary design. This workbook is designed as a best practice document. Similar documents are either completed or are being prepared for three other best practice workshops from the past year— practices in co-op/internship programs, mentoring, and bridge programs. The TBCD CFT began development of a CD-based video presentation on exemplary technology-based teaching techniques and facilitated the release of the first "SUCCEED's Greatest Bits" CD-ROM featuring some of SUCCEED's best efforts. Volume II of that series is due to be released later this summer before the ASEE Conference.

In addition to the employer feedback instrument piloted by the OA focus team, some of the other tangible products of the past year are new assessment instruments. At NC State, the first draft of an assessment survey for industry interviewers has been developed. This instrument will allow industry interviewers to assess how well departments in the College of Engineering are achieving various aspects of their educational objectives. The University Career Center has agreed to distribute the survey during fall 1999. This is the first step in developing a Coalition-wide assessment tool. The TBCD representative at NC A&T has developed a draft assessment instrument. UF introduced the use of student portfolios, refined alumni, employer, and graduating student surveys, and established

industry focus groups. UNC Charlotte conducted improved student and faculty surveys; and Clemson developed an employer fax survey process for engineering programs.

Assessment and Evaluation

Assessment and evaluation is critical both to identifying the impact of the Coalition and to providing the evidence necessary to support the adoption of the Coalition's programs and models by other institutions.

A centralized database of engineering faculty at all of the SUCCEED campuses has been completed. Without such a central database, only total attendance at each SUCCEED-sponsored event can be recorded, an approach that is fraught with redundant counting. Since the faculty most committed to educational reform will be engaged in multiple activities, the central faculty database can be used to identify how many unique faculty have been impacted by SUCCEED.

A report was issued on the results of an e-mail survey administered to all SUCCEED engineering faculty (503 responses, 32% of Coalition engineering faculty) on the use of innovative teaching practices and campus level of support for teaching, results were published in the proceedings of 1998 Frontiers in Education Conference (FIE). A report was also issued summarizing the results of the Instructional Technology Needs survey distributed during Year 6.

The complete cycle of qualitative case study visits mentioned earlier included interviews of faculty and students involved in CIT and CFT activity as well interviews of non-participant students and faculty, deans, and department heads during each visit. Individual campus reports have been prepared and distributed to the campus CIT and CFT leaders and the Coalition Director. Each CIT leaders has or will submit plans for dealing with recommendations, concerns and issues cited by the review team in the reports. An Interim Summary Report of progress and operations on the campuses visited in Year Six was prepared and shared with the NSF, the Coalition leadership and Deans. A final summary report covering all eight campuses is now in preparation.

The SUCCEED Longitudinal Database, which contains both performance and demographic information on all undergraduate students in the Coalition beginning with the 1989 cohort, has been updated for 1997 and is now in the process of being updated for 1998. Two studies have been conducted and completed using the LDB. The first is a graduation percentage study by institution and engineering discipline that categorizes students by initial discipline into four groups:; those who graduated in that discipline, graduated in another engineering discipline, graduated outside engineering or didn't graduate. The second study is a second-year retention study by gender for both engineering and non-engineering students. A report of the data and analysis of the Coalition-wide Student Climate Study completed in 1997 has been published and distributed. The data reported is by institution and the entire Coalition. Each institution

has been provided with the responses from its own students for further analysis it may wish to perform.

The annual report comparing SUCCEED enrollments and numbers of graduates (beginning in 1989) with those of other engineering schools in the country both by gender and ethnicity was updated with 1998 data from the American Association of Engineering Societies. The report will be published and distributed to the Coalition schools and the National Science Foundation.

Assistance was provided to the FD CFT in the development, administration and analysis of a faculty survey on undergraduate teaching. The results have been published and distributed in a SUCCEED report and a paper has been accepted for the 1999 FIE Conference. Other journal articles are in progress. Similar assistance has been provided to the Technology Based Curriculum Delivery CFT to survey Coalition faculty needs and interests in technology delivery systems and methods.

Six product dissemination case studies to determine factors that promote successful diffusion of educational innovations have been completed. A report summarizing the results and conclusions of the first three case studies has been published and distributed. A report of the second three studies is now in progress. Two papers reporting the results of the study have been prepared and submitted to the Journal of Engineering Education and the 1999 International Conference on Engineering Education. Based on the results of this study, three PIs and their projects have been identified for special dissemination efforts now in the planning stage.

Course/Curriculum Modifications

Since SUCCEED is about making changes in the way courses are taught and the curriculum is delivered, significant accomplishments were made in this area as well. In addition to Clemson's Multidisciplinary Design program and modifications to the first year sequence initially taught in the new form in fall 1998 and spring 1999 semesters, a fully asynchronous pilot course was offered in Computer Science, and extensive use of Asynchronous Learning Networks (ALNs) was developed in several courses (notably, in Industrial Engineering); web-based materials were developed to support a multi-campus shared course in computer organization.

NC A&T received external support for a Teacher Intern Program and for the Alliance for Learning and Vision for Underrepresented Americans expanded to 4 sites with 15 students—the average first semester GPA of the students participants was 3.80. UNC Charlotte used the Web Course-in-a-Box discussion forum features to facilitate team projects and discussions in Introduction to Engineering Practice and Principles, delivered one course (Engineering Mechanics I - Statics) to two remote sites via the Multi-Cast Internet Backbone (MBONE), and implemented a pilot project using Real Education for delivery of Engineering Courses online (Electrical Circuit Analysis developed for web-based delivery and used as supplemental instruction for on-campus students).

As indicated earlier, Virginia Tech is committed to a wide variety of innovations that impact a large number of students. Virginia Tech is also committed to offering its entire engineering student body a multidisciplinary capstone design course—70% of all students are involved in multidisciplinary capstone design projects; the goal is 100%. This focus of education on engineering applications occurs earlier in the curriculum as well; students at the sophomore level are already engaged in engineering projects that used to be limited to seniors. A section of Engineering Mechanics was taught to evaluate and improve the Multimedia Learning Environment program, and web and other technology was integrated into two undergraduate classes, including one distance learning class.

NC State continues to make progress towards an Electrical and Computer Engineering honors program—the first honors course is scheduled for the fall of 1999, and provided support to encourage development of web-based materials for four courses, ($21,000 in early 1998, $31,000 for 1998-1999). web-based versions of the following engineering courses have been enhanced: Introduction to Computing – C++; Introduction to Computing; Electric Circuits I; Digital Logic Design. All courses were offered using MBONE technology during 1998-99. Sites receiving these courses included UNC Asheville, UNC Wilmington and Lenoir Community College.

FAMU-FSU offered a Carnegie Mellon class through videoconferencing, piloted an offering of a first year course (which was reviewed by an Ad Hoc Committee that made recommendations for institutionalization), and piloted a real-world engineering multi-disciplinary collaborative design course. Georgia Tech placed curriculum technology modules into academic support processes and developed a pilot design competition for undergraduates as a precursor to a broader freshman design course. UF's Integrated Product and Process Design (IPPD) program has been extremely successful in providing students with an insight into real industrial problems and the means to solve them. The program is currently running at its maximum capacity (around 23 projects). UF also promoted widespread usage of web-based teaching for on-campus and off-campus students, delivering four undergraduate courses entirely online.

Special Programs for Student Success

Georgia Tech's continuous improvement of the Challenge program, mentioned earlier, sets a high standard of demonstrated success. A large number of programs at the other SUCCEED institutions strive for the same quality and reputation.

At UNC Charlotte, 166 students received mentoring through the MAPS (Maximizing Academic and Professional Success) program in the fall 1998 semester. In the same semester, Supplemental Instruction was offered for five College of Engineering courses. There was a total of 1,436 SI contact hours during this semester throughout the University, of which College of Engineering SI courses accounted for 40% of the total—this is important to note because only 27% of the students in SI courses were from the

College of Engineering. UNC Charlotte also initiated work and study exchanges for its students with institutions in Germany and Spain, and sent five students to France to work and study April-July, 1998. UNC Charlotte also developed an undergraduate engineering professional development seminar series featuring alumni and local professionals—topics include ethics, global and contemporary issues, and professional registration.

At NC A&T, an cost-effective summer bridge program supported by the Alliance for Learning and Vision for Underrepresented Americans (ALVA) was initiated, and an industry-supported professional development workshop series was also established. Corporate sponsorship for the Visions summer program was also identified. UF's STEPUP program for incoming minority freshmen shows improved retention and is almost ready for institutionalization, while the Community College Interface program has been expanded to accommodate nearly half the incoming CC transfer students while still maintaining program success in terms of improved retention. Women engineering students at NC State can now participate in a peer mentoring program or an e-mail mentoring program using practicing engineers from industry. At Clemson, a pilot peer-mentoring program for freshman engineering students was initiated, and the international program continued successfully, with a new International Engineering and Science minor proposed and approved by the university.

Web Pages

Web pages continue to provide an inexpensive tool for broad dissemination, and is especially useful for exchanging and storing information within the Coalition. A number of sites were created or significantly improved in the past year. A sample of them is found here. Many of these are easily accessible from the main SUCCEED web page.

Content featured	Web site address
SUCCEED's main web page	http://www.succeed.vt.edu/
SUCCEED projects database	http://www.succeed.vt.edu/projects/data.html
Outcomes Assessment Best Practices	http://www.succeed.vt.edu/focus/oa.html
SUCCEED's videoconferencing	http://www.visc.vt.edu/succeed/conferencing/index.html
UF FD web site	http://www.ce.ufl.edu/~cglag/fac_dev/fac_index.htm
SUCCEED calendar of events	http://www.ce.ufl.edu/~succeed/calendar.html
Student Transitions web site	http://www.coe.uncc.edu/st/mil.htm
Multimedia Statics software site	ftp://www.ce.vt.edu/pub/statics/statics-zip/mle.exe
Virginia Tech Virtual Corporations	http://www.ee.vt.edu/virtcorp/
UF Elec. Eng. online courses - Linear controls; Signals and systems; Circuits I; Circuits II	http://csc3.list.ufl.edu:8900/webct/public/show_courses
SUCCEED's partner Center for Excellence in Undergraduate Teaching at Virginia Tech	http://www.edtech.vt.edu/ceut/
UF's Integrated Product and Process Design program	http://www.ise.ufl.edu/ippd/
UNCC FD web site	http://www.coe.uncc.edu/dept/ece/succeed/
Introduction to EOS, Carol Miller, CS	http://www.csc.ncsu.edu/info/e115_info/www/index.html
C++, Jo Perry, CS	http://www.csc.ncsu.edu/info/csc114_info/www/index.html

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Content featured	Web site address
Electric Circuits I, Griff Bilbro, ECE	http://www.ece.ncsu.edu/info/ece211_info/
Fundamentals of Logic Design, Clay Gloster, ECE	http://www.ece.ncsu.edu/info/ece212_info/
Introduction to Programming	Under development summer 1999
Software Engineering	Under development summer 1999
Introduction to Polymer Chemistry	Under development summer 1999
Georgia Tech's Classroom-2000	http://www.cc.gatech.edu/fce/c2000/
Joseph A. Ware Advanced Student Project Laboratory	http://www.t.edu:10021/eng/ef/griffin/warelab/warelab.html

Educational and Assessment Infrastructure

With a focus on implementation in this second phase of SUCCEED, it is no surprise that a number of our most significant accomplishments are toward making improvements in the administrative process and physical plant that will improve education and assessment at our institutions. Many of the accomplishments described in this section, especially those to the physical plant, are not funded by NSF money, but through institution or external sources in response to a need discovered in the planning and execution of SUCCEED efforts.

Significant steps were taken to put in place personnel for both the leadership and support of a wide variety of educational advances. To support technology infusion, FAMU-FSU hired a staff member to assist faculty in using technology and Clemson initiated a pilot program of student technology assistants to help faculty who are teaching special sections of freshman courses adjust to the new Universal Computing Environment. NC State identified two faculty members, Jim Nau, in Civil Engineering, and Tim Clapp, in Textile Engineering, who have assumed a leadership role in workshops and COE-Teach, NC State's learning community. UNC Charlotte's College of Engineering mentoring program (MAPS) hired a full-time assistant director in order to expand the program, which is in high demand. The SUCCEED team played a significant role at Georgia Tech in the hiring of a Director of Assessment. In fact, the Institute selected one of the members of SUCCEED's OA CFT from North Carolina State to be the Director. The SUCCEED team continues to influence the direction of administrative policy in the establishment of a position for a half-time Associate Dean, who will work on FD and strategic planning issues. A number of other universities are also putting personnel in place to support assessment. At North Carolina A&T, the dean appointed a faculty member (the NC A&T OA team member) as the OA Director for the College, also providing him with suitable release time and resources to lead OA activity in the college. NC State identified assessment coordinators for nine engineering departments who will form the OA Team for the College.

Developing partnerships with existing university structures and the generation of College-of-Engineering-based learning communities is also critical to our success. In addition to those mentioned in the highlights, there are other partnerships in the works. Our FD CFT started the Teaching Leader Network (TLN) mail list to connect leaders from all the campuses. The NC State College of Engineering established collaboration with the

College of Agriculture and Life Sciences on a web course delivery system that leverages the existing infrastructure. The TBCD leader at NC A&T meets regularly with the associate vice chancellor for academic affairs, and the FAMU-FSU College Curriculum Committee and FAMU-FSU CIT worked jointly to spearhead a review of all BS degree programs.

Virginia Tech's Engineering Learning Community and NC State's COE Teach meet regularly and are expanding the number of faculty who participate. FAMU-FSU has a faculty group that discusses mentoring issues using the experiences of legendary engineers as a focal point. In addition to the learning communities developing on our campuses, more specialized assessment communities are also nascent. The Georgia Tech Engineering Assessment Seminar (GTEAS) meets monthly while weekly assessment meetings at North Carolina A&T are attended by representatives from all departments.

Progress has also been made in developing the technological infrastructure of our institutions. Clemson's Universal Computing Environment pilot study was developed and implemented. Georgia Tech's videoconferencing facility was brought on line, NC A&T established a laboratory for collaborative learning environments, and UF established a Streaming Media Facility for the College of Engineering. Classroom 2000, a College of Computing project at Georgia Tech, is building a classroom in which everything that happens is captured and then disseminated via the web with tools that automate the process. The College of Engineering is benefiting by using the technology developed in this project in teaching engineering classes.

The UNC System plans to enhance communication/collaboration through the common web-based video teleconferencing system (MBONE), which they continue to expand. UNC Charlotte modified an existing classroom to support a trial installation of the technology for delivering courses over MBONE, and NC State deployed web-based MBONE video conferencing technology to UNC-Wilmington and Lenoir Community College. At UNC Charlotte, one faculty member and one student assistant were trained in the use of MBONE software.

UNC Charlotte's MAPS Technical and Professional Development Resource Library was expanded to include a variety of materials requested by students.

Curriculum renewal is still a strong theme at SUCCEED institutions. The Virginia Tech Department of Mechanical Engineering's renewal based on the SUCCEED model is completed, and the following departments have completed one cycle of curriculum renewal: Electrical and Computer Engineering, Materials Science and Engineering, Mining Engineering, and Chemical Engineering. Also, NC State developed a new Electrical Engineering and Computer Engineering curriculum, approved by the faculty in August, 1998.

In addition to UNC Charlotte's substantial commitment to designing a comprehensive OA data system, other institutions have invested in designing tools to facilitate education

and assessment. Templates for technology were created at a number of schools: Clemson created on-line tutorials in Microsoft Word, PowerPoint, and FrontPage and made Collaborative learning environment tools easily available to all CES faculty through WebCT (a course management package) and through a package developed locally; FAMU-FSU developed a template to allow faculty to build course web pages easily; NC A&T is evaluating WebCT as a course administration tool; UNC Charlotte implemented a mass e-mail communication system (to all COE students) in fall 1998 and installed Web Course-in-a-Box (another course management package), demonstrated the software to the faculty, and encouraged its use. Across the Coalition, 12 pilot programs are investigating the effectiveness of new technology tools.

Guidelines or templates for OA were also developed: a programmatic set of templates designed at Virginia Tech was adopted as a best practice for OA CFT workshops; 10 out of 12 UF departments have participated in a project to test OA methods and procedures; three SUCCEED campuses are piloting portfolio usage for the Coalition; at NC State, educational objectives were developed and an assessment matrix created showing how the four objectives are measured by the nine assessment procedures; the FAMU-FSU CIT recommended a template to all departments that they may use to organize their efforts to meet ABET EC 2000; Clemson engineering programs will prepare for accreditation review with the aid of an ABET Engineering Criteria 2000 Program Planning Guide and Suggested Report Format Templates for ABET Self-Study documentation, both developed by SUCCEED; and Georgia Tech established standards to evaluate performance of transition efforts.

The FD CFT compiled a list of teaching incentives and rewards and distributed them at a special session for administrators and mentors at the 1999 SUCCEED Conference, and is preparing them for wider distribution. Two schools have introduced new incentives to encourage innovative and effective teaching – Clemson initiated a Faculty Teaching Fellows program for mentoring engineering faculty and FAMU-FSU implemented an annual incentive and awards program—five awards of $500 each to faculty who adopt innovative and effective teaching methods.

D. Future Plans

Highlights of our extensively documented strategic and tactical plans are presented here.

Faculty Development

In the next year, model of rewards and incentives for effective and innovative teaching will be updated and disseminated to all CIT leaders and SUCCEED department chairs and deans. The survey of faculty teaching practices will be repeated and analyzed. An updated version of the Orientation to Teaching Workshop will be presented, and there will be two teaching-leader training events and on-site assistance as needed. At the SUCCEED conference in spring, 2000, the team will meet with teaching center directors to enhance cooperation and institutionalization. A manual of best practices in FD will be finalized and disseminated based on the April 1999 Cross-Coalition Conference, and the model of engineering FD will be presented at ASEE 1999 and published in faculty development and engineering education journals.

Outcomes Assessment

The team will collaborate with the FD CFT to bring OA to a wider group of faculty. The team will continue to be leaders in developing instruments and processes by implementing their Employer Feedback Process Coalition wide, expanding their portfolio project to all SUCCEED campuses, and assessing the use and satisfaction of capstone design feedback instruments. The team will rewrite the Curriculum Innovation and Renewal Manual to fit with the OA Planning Guide and write a proposal to obtain funding for publishing successful case studies. Finally, the team will determine SUCCEED eligibility for the Baldrige Award.

Student Transitions

The team will identify progress toward implementation and institutionalization at the halfway point in our second phase through a conference mechanism. A first-year and internal bridge conference will focus on best practices in scale-up and institutionalization of first year courses and identify best practice on "internal bridge / gateway" courses. As a follow up to the multidisciplinary design workshop, experienced multidisciplinary design course practitioners will evaluate mini-grant implementation proposals.

Technology-Based Curriculum Delivery

This team is collaborating with FD CFT to produce a CD-ROM and supporting materials on effective teaching with technology. The CD will have classroom clips showing the effective use of technology along with interviews of the teachers and students. It will also include classroom materials such as the syllabus and instructional objectives, a typical class web page, and handouts to students. The team will re-administer the faculty survey as follow up to the Year 6 "Faculty Use of Technology Survey."

E. Evaluation

Effective assessment and evaluation is vital to successfully conduct and determine the impact of large projects like SUCCEED. It is the means used to determine the progress being made towards achieving the project's goals, to provide verification of the results and conclusions of project activities, and to establish the basis on which others will accept the value and usefulness of the effort and its results.

SUCCEED's Assessment & Evaluation Program

SUCCEED's assessment and evaluation (A&E) program seeks to conduct assessment at different levels and from different perspectives. There are four levels of assessment and evaluation required in SUCCEED: (1) Coalition-wide, (2) college-wide, (3) degree programs and (4) individual projects. To coordinate efforts across these four levels SUCCEED established an Assessment and Evaluation Coalition Service Team (A&E CST). This team consists of specialists with knowledge and experience in both qualitative and quantitative assessment and evaluation activity.

Across the four levels of need, the A&E CST's responsibility is the following: at the Coalition level, the team is responsible for planning, conducting, and reporting the overall progress of the Coalition. It will also assist the CFTs in planning and conducting their own A&E. At the college level, the A&E CST will assist the CITs in planning and conducting their own A&E. All SUCCEED teams and projects should develop and implement an A&E program as part of their Strategic Plan. At the degree program level, assessment will be the responsibility of the OA CFT. The A&E CST will assist the OA CFT with the SUCCEED longitudinal database as needed. At the project level, the A&E CST will provide assistance to project leaders on an as-needed basis to help plan and implement their own A&E activity.

Qualitative A&E Campus Studies

Qualitative campus case studies are conducted as part of the team's Coalition-wide A&E responsibility. These studies include two to four day site visits to each campus with interviews of participants, administrators, students and all CIT members to assess and evaluate progress and achievements that the CIT has made relative to its plan and overall SUCCEED goals. Four visits are scheduled each year so that all eight campuses will be visited twice in four years. Annual campus and Coalition reports will be submitted to the campuses, Coalition leadership, and the NSF.

Qualitative case studies using these same methods will also be conducted periodically to determine the status and effectiveness of the Coalition's leadership and management, its Council of Schools Program, and the overall dissemination efforts of the Coalition.

Quantitative A&E Project Activity

SUCCEED's longitudinal database of student demographics and performance will continue to be refined and annually updated. Annual reports of quantitative results will be published on (1) comparison of SUCCEED and National engineering enrollments and degrees awarded, (2) Coalition retention and graduation performance by institution, gender, ethnicity and discipline, and (3) quantitative metrics of CIT and CFT activities, events, and participation. The data gathered in the two Student Climate Studies conducted by the Women Engineer's Board will be further analyzed by institution and discipline and reported.

A&E Consultative Assistance

The A&E CST will provide assistance to members of the CITs and CFTs with their assessment activities. The A&E CST offers the expertise of program evaluation professionals and invites SUCCEED teams to take advantage of its services.

The A&E CST can and will:

- Assist with the preparation of evaluation plans
- Review evaluation plans
- Review survey instruments
- Assist with data review and interpretation

A&E CST members are also available on an arranged basis for the following:

- Project evaluation
- Assessment activities including interviews, focus groups and document analysis
- Survey design, fielding, analysis, and reporting
- Data analysis and reporting

Special A&E Project Activity

One project in this category is to collect, create, distribute and maintain a catalog of SUCCEED products and curriculum components. This catalog will be updated every other year. A second project is to identify project leaders with viable SUCCEED products and to assist them with dissemination efforts. The plans for these efforts will be based on the lessons learned from the six case studies of products already disseminated and adopted. The progress of these dissemination efforts will be monitored and assessed. A third special project will be the planning, in spring, 2000, of a Summative Evaluation of the entire SUCCEED project. The Summative Evaluation will be conducted in the last two years of the NSF grant period and reported on as the SUCCEED project is completed.

F. Dissemination

SUCCEED has had success in all approaches to dissemination, including traditional and more active modes of dissemination. Our Council of Schools holds such promise for dissemination that the model was adopted by the Foundation Coalition.

> ***"I was recently given a copy of your SUCCEED CD-ROM and think it is wonderful. Congratulations..."***
> *– W. Tad Foster*
> *Indiana State University*

Council of Schools

The Council of Schools partnership has, at a number of the institutions, developed into a true partnership, with SUCCEED drawing on the strengths of the Council's member schools as well as disseminating SUCCEED products and processes. In addition to general meetings of all Council of Schools members at the ASEE and FIE Conferences in June and November respectively, SUCCEED has completed six campus visits to talk about SUCCEED and engage the member schools in strategic planning: University of Central Florida, Virginia Commonwealth University, Mississippi State University, Michigan Technological University, University of Louisville, and San Jose State University. On a follow up visit with Mississippi State, a SUCCEED representative met with three department heads, the dean, and the associate and assistant deans. The SUCCEED FD model was shared, and incentives and rewards were discussed. Mississippi State's College of Engineering decided to have their faculty take the SUCCEED faculty teaching practices survey immediately. The survey replies have been directed to a SUCCEED representative to preserve confidentiality, and so far 57 out of 107 faculty (53%) have responded—a very high response rate.

Conferences

This past year, the Coalition had a presence at the ASEE Conference, the Frontiers In Education Conference, and at EDUCOM. In addition, a paper describing a SUCCEED-developed integrated process for ABET EC 2000 preparation and curriculum innovation and renewal received a 1998 ASEE Award. The SUCCEED booth display at these three 1998 conferences in 1998 distributed approximately 1500 of our "SUCCEED's Greatest Bits Volume I" CD, over 1000 copies of our newsletter, *The Innovator*, and a variety of other promotional and informational material. The 6th annual SUCCEED Conference was held in Raleigh, NC, in April with over 135 in attendance. While our annual conference continues to be an excellent venue forum for internal dissemination, the focus this year was to provide a central location for FD through a series of workshops. The OA CFT continues to be very successful at disseminating its best practices, making presentations at six national and international conferences in the past year.

Dissemination Using a Variety of Media

SUCCEED continues to use the web for cost effective dissemination both within and outside the Coalition. A sample of web resources can be found in Section C. Volume II of

the successful "Greatest Bits" CD-ROM will be released in time for this year's ASEE conference. Three issues of the *The Innovator*, SUCCEED's newsletter, were published with a distribution of approximately 4000 per issue, including internal distribution, to all U.S. engineering deans, at conferences, and to our Council of Schools partners.

Inter-Coalition Efforts

The SUCCEED-initiated Cross-Coalition collaboration has successfully continued, with meetings at the ASEE and FIE conferences, and two cross-Coalition best practices workshop meetings, one focusing on assessment at Rose-Hulman in October 1998 and another on faculty development in April 1999 at NC State. The first of these cross-Coalition workshops, which focused on the freshman year, was held in February of 1998, and led to four sessions at the FIE conference and a paper on the workshop was selected as one of the best papers of the conference.

Project Transfer

A number of campuses reported special efforts to facilitate internal dissemination. Clemson supported a faculty member in importing Siegfried Holzer's "statics" software. Virginia Tech PIs are also assisting faculty at Clemson and Mississippi State in implementing elements of their Multimedia Learning Environment (MLE); interest in this approach continues to grow, as more than sixty faculty in the past year requested instructions for downloading the MLE software from the Internet. A team of three from UNC Charlotte visited Virginia Tech to learn about Virginia Tech's Minority Engineering Program and determine what best practices could be incorporated into the MAPS program.

G. Industrial Involvement

SUCCEED continues to have a wide variety of industrial involvement—through program (and Coalition) evaluation / advisory roles, through direct financial support, and through contact with our students. Mentoring is the most active of these, usually incorporating some element of the advisory / support role.

Program evaluation / advising

SUCCEED's EAB continues to play a more active role than is typical of such bodies. Each member serves both the Coalition as a whole and one focus area in particular in an advisory capacity. This closer relationship with the focus area within their expertise has tapped the expertise of our EAB in the process of design and implementation. This interaction has continued to be most significant in the OA area. In the past year, EAB input and influence was invaluable in the construction and testing of an employer feedback instrument and process.

Institutionalization / extension financial support

The most concise manner to convey this information is in the following table. This list is certainly not comprehensive.

Activity supported	Supported by	Support level if available
NC A&T ALVA summer bridge program, a Prof. Dev. workshop series (AGGIENEER), Visions, and a Teacher Intern Program	Support sources and levels not available at time of report	
NC State University Center for Minority Engineer Development	BP Amoco Foundation	$50,000/yr for three years
NC State Introduction to Engineering / Freshman Physics	Equipment grant from Hewlett-Packard	$250,757
UNC Charlotte College of Engineering Teaching Day	Alcoa	$2000 + cost of luncheon
UF Online Degree program in EE	Sloan Foundation	$135,000
UF STEPUP program	Lockheed-Martin (endowment)	$400,000
UF SUCCEED Expo	BellSouth	Luncheon
Virginia Tech follow-on of Vertically Integrated Design	Boeing support of Multidisciplinary / International project	$125,000
Virginia Tech Joseph A. Ware Advanced Student Project Laboratory	$800,000 renovation of a 10,000 sq. ft. facility to house inter-disciplinary projects leveraged by external support.	$600,000
Virginia Tech Raymond and Violet Frith Freshman Project Lab	Alumni giving Student Engineers' Council	$250,000 $10,000
Virginia Tech Virtual Corporations	Motorola Lockheed-Martin part of a grant of Westinghouse part of a grant of	$50,000 $70,000 $60,000
Virginia Tech Dissection Laboratory	Lockheed-Martin over three years Several companies (dissection items)	$80,000 $12,000 ea.

Mentoring / Consulting to Student Teams

This information is also presented in tabular form, but focuses on projects where industrial involvement was of a mentoring / consulting nature. While support level is included where the mentoring was accompanied by financial support, these figures *do not* include estimates of the value of the industry employee's time.

> ***"The IPPD program--A true university / industry partnership--is an excellent model for improving the quality of undergraduate engineering education."***
> *– Dr. Alexander Nauda*
> *Manager, Research & Advanced Technology*
> *Raytheon E-Systems Communications Division*

Activity supported	**Supported by**	**Support level if available**
Clemson Internationalization (EPIC)	BMW Manufacturing (2 internships) Fluor Daniel (2 internships) BASF Corporation (3 internships) Robert Bosch (1 internship) Square D Company (3 internships) Cryovac Corporation (1 internship) Dow Chemical (1 internship) Draexlmaier Automotive (1 internship)	$20,000 $20,000 $32,000 $8,000 $24,000 $12,000 $10,000 $6,000
NC State Women's E-mail Corporate Mentoring Program	33 mentor / mentee pairs have been connected	
UF Integrated Product and Process Design	In addition to mentoring student teams, each of 23 companies contributes $15,000 to offset program expenses. There is a long list of past sponsors and potential sponsors for future projects.	$345,000

H. Evidence of Culture Changes

This section is taken from the observations of the qualitative assessment case study team, to be published in Brawner, C., Serow, R., Demery, J., and Zorowski, C., "Impact, Institutionalization and Innovation Diffusion: An Evaluation of the SUCCEED Coalition," Frontiers in Education November 10-13, 1999, San Juan, Puerto Rico.

> ***"It was good to see as many as 20 engineering faculty participate in a discussion of teaching that was as stimulating as any I have seen. The presence of faculty outside engineering (math in particular) was also good to see."***
> *– Terry Wildman*
> *Director, Center for Excellence in Undergraduate Teaching, Virginia Tech*

As a result of the organizational structure of SUCCEED and the need for the constituent groups to constantly communicate, a bond has been forged among the participants that, in the words of one respondent, "would take as long to tear apart as it did to build." Indeed, the collaborative environment that now exists needed to overcome significant hurdles that were in part the result of competition among the institutions for students and resources. Within this environment, SUCCEED fostered a sense of community among those scholars who were dedicated to improving the undergraduate engineering experience. These professors, who may have felt alone in their departments, found like-minded peers in other departments at their home institutions as well as at other institutions in SUCCEED. This spirit of collaboration prevented many good ideas from withering on the vine due to lack of resources and support and helped the advocates of better undergraduate education reach the critical mass necessary to gain a voice among the faculty.

In addition to creating a community among faculty members at different universities, SUCCEED provided leverage for institutions to make changes in areas deemed important. While many of the institutional changes found at the SUCCEED campuses would probably have happened anyway, SUCCEED provided the funding and environment to get the job done sooner and better. A primary example of this is in the OA area. With the advent of the ABET EC 2000, the assessment of student outcomes has become an important part of preparing for the accreditation process. The mission of SUCCEED's OA CFT became to provide a model of the accreditation process for institutions by providing workshops and other tools. In addition, the team decided to undertake the difficult task of developing a reliable and valid measure of student outcomes as applied to the workplace by developing an employer survey. By developing and fielding this instrument, the team was able to do for all eight SUCCEED institutions, and others who share the result, something that each of them would have had to do individually.

An area in which most institutions have concentrated their resources is that of student transitions, both from high school or community college to the university and from the university to the workplace. With the help of SUCCEED funds, most of our member institutions have dramatically changed their method of teaching freshman engineers. Before SUCCEED, most of the colleges taught a one or two credit hour general

engineering class that consisted of a series of faculty members lecturing to a large group of students about each discipline of engineering. Also, the students took no other engineering courses until their late sophomore or junior years. This model was relatively efficient from a resource perspective, but it was uninspiring to a number of would be engineers, many of whom dropped out of engineering majors before their junior year. The new model, adopted on most campuses, involves giving freshman students laboratory and small group experiences where they have an opportunity to see the practical applications of engineering. Many of these experiences were developed during the first five years of SUCCEED and have been integrated into the new freshman curriculum. This model is much more resource-intensive than its predecessor, requiring lab experiences to be designed and supervised and requiring more faculty resources to teach the smaller classes. However, it is very appealing, not only to the freshmen, but also to their parents and to potential donors. An alumnus at Virginia Tech was so impressed by the freshman laboratory experiences demonstrated by the pilot project that he made a substantial donation to the College of Engineering to create and furnish a permanent lab space and provide an endowment for staff support for the class. In addition, the College sought and received corporate donations of materials for the students to inspect, take apart, and reassemble as part of their lab experience.

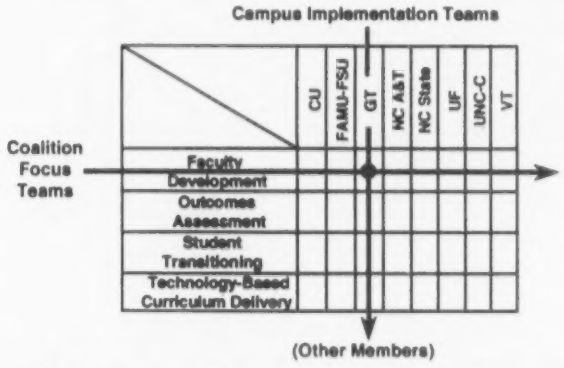
At the other end of the students' academic career are experiences designed to prepare them for the workplace. Both ABET EC 2000 and employer advisory boards have indicated that it is important for graduates to be able to function on teams in general and on multidisciplinary teams in particular. UF developed the Integrated Product and Process Design (IPPD) multidisciplinary design experience centered on the capstone design requirement found in most disciplines. In this experience, students apply to participate on one of 22 projects that are proposed by industrial sponsors. Each team has students from more than one discipline and a faculty coach to advise them. Students are selected for the program based on their academic record and approximately one third of seniors participate. Every department enthusiastically supports this endeavor, although they do not all participate. Some initial funding for this project came from SUCCEED, but now the industrial sponsors are asked to provide a substantial portion of the funding (which they do willingly) with the balance coming from the College and SUCCEED.

In addition to directing resources toward improving the student learning experience, SUCCEED has a goal of establishing a comprehensive engineering FD program on each campus. One way in which this is done is by providing teaching effectiveness workshops for new faculty and by identifying teaching leaders well versed in effective teaching methods who are willing to act as mentors. One of the critical approaches taken has been to integrate engineering faculty development efforts with university-wide efforts. The faculty development leaders at most of SUCCEED's member institutions are orchestrating partnerships with university teaching centers to offer workshops and ensure relevance to the engineering community to improve the likelihood that engineering faculty development will continue beyond the end of SUCCEED funding.

I. Infrastructure

Among SUCCEED's strengths is its organizational structure. The matrix of Coalition Focus Teams and Campus Implementation Teams (shown below) ensures representation from each campus in each focus area and a representative from each focus area on each campus. In this manner, we tap the expertise of each campus, creating a diverse talent base, while at the same time providing a conduit for the practices of each institution to be shared and considered for implementation at the other campuses.

> ***"As a result of the organizational structure of SUCCEED and the need for the constituent groups to constantly communicate, a bond has been forged among the participants that would take as long to tear apart as it did to build."***
> *– Respondent during interview for qualitative case study*



The use of videoconferencing equipment continues to reduce travel costs and improve communication within SUCCEED's Guidance Team and its other teams. As a result, the Guidance Team has been able to have more frequent, shorter meetings, while the Coalition Focus Teams have been able to meet every other month on average, a frequency that was previously inhibited by the prohibitive cost. The videoconferencing process continues to improve as well. With the help of the TBCD team, we are refining the process of videoconferencing for use in Coalition management including the development of a mechanism for sequencing user interaction.

Our restructured External Advisory Board, designed to better tap the intellectual expertise of the EAB members, continues to bring an important perspective to program evaluation and planning. More details are found in the "Industrial Involvement" section.

> ***"I'd like to thank you and your staff for your outstanding service in processing invoice payments... whenever we send an invoice for reimbursement, it's processed promptly and we received payments in a very timely manner."***
> *– Hong K. Vu, Sponsored Programs University of North Carolina at Charlotte*

With experience as a teacher, the Coalition management has become adept at allocating funds under the new structure for the second phase of SUCCEED. On recommendation of the Deans Council, a subgroup of the Guidance Team, specifically the Director and the CIT Coordinator, are responsible for final funding decisions after consideration by the Guidance Team is complete. At the point of contract execution and payment of invoices, our extraordinary success has been noted by the UF administration and by the sponsored research personnel at our member institutions.

J. Value Added by the Coalition

SUCCEED's leadership role in the establishment of a engineering education research community continues to grow. SUCCEED's activities and its influence are seen in most issues of the Journal of Engineering Education (18 articles since 1993 feature SUCCEED-sponsored activities) and 130 articles in recent ASEE (1996-1998) and FIE (1997-1998) conferences describe activities at SUCCEED institutions. SUCCEED's activities and developments also regularly enhance ASEE's *Prism* magazine. SUCCEED's members have been involved in the International Conference on Engineering Education as cosponsors, panelists, committee members, and authors. The 1998 and 1999 ICEE conferences together list 25 published or accepted papers by SUCCEED authors. SUCCEED is also playing an active role in making systemic change—our Council of Schools concept promises to extend the reach of SUCCEED's innovations, and the cross-Coalition initiated by SUCCEED is extending the reach of the entire Coalitions program.

In addition to the Journal of Engineering Education and the conferences mentioned above, SUCCEED investigators publish in a number of other. These include (but are not limited to) the following journals and conferences: Chemical Engineering Education; IEEE Multimedia; Journal of Artificial Intelligence and Education; World Conference on Educational Multimedia and Hypermedia; Second International Conference on the Learning Sciences; Journal of Educational Multimedia and Hypermedia; American Educational Research Association; AAAI Workshop on Indexing and Reuse in Multimedia Systems; Professional and Organizational Development Network in Higher Education; International Consortium for Educational Development in Higher Education; International Conference on Multimedia Engineering Education; Workshop on Reform of Undergraduate Mechanics Education; International Journal of Engineering Education; ASEE Southeastern Section Meeting; Best Assessment Processes in Engineering Education II, a Working Symposium; AAHE Conference on Assessment; NIST and National Policy Association; and the International Mentoring Association.

> ***"...the SUCCEED Outcomes Assessment workshop I attended was the best of the many I have attended since beginning preparation for ABET EC 2000.."***
> *– Kuei-wu Tsai, Associate Dean*
> *San Jose State University*

The establishment of best practices by each of our focus teams is providing a model for the nation's engineering colleges to guide implementation of a wide range of educational innovations. Our OA team's workshops have received very favorable feedback from the engineering education community. The ST CFT workshops on best practices in bridge and mentoring programs had attendance by special request from a number of institutions beyond the SUCCEED and the Council of Schools.

SUCCEED is engaging the United States engineering education system in a variety of ways. Our comprehensive and innovative products and processes, coupled with our active dissemination efforts, is expected to have a significant impact on the nation's engineering education system.

K. Budget Information

This section includes a detailed description of allocations for the period September 1, 1998 through August 31, 1999, referred to as "Year 7" or "Y7." Also included in this section is an itemized budget request for the period September 1, 1999 through August 31, 2000 ("Year 8" or "Y8").

Funding was provided to the participating institutions by subcontracts for the annual period September 1, 1998 through August 31, 1999 of the cooperative agreement between the NSF and SUCCEED. The work to be performed under these subcontracts is a series of specific tasks. Each task is identified by a specific work statement under management by a designated principal investigator (PI). Each budget is required to specify a matching amount of cost sharing approved by the responsible institutional fiscal officer. Detailed budget allocations and matching funds for Year 7 follow.

BUDGET TABLE OF ACRONYMS

CIT	CAMPUS IMPLEMENTATION TEAM
FD	FACULTY DEVELOPMENT
OA	OUTCOMES ASSESSMENT
ST	STUDENT TRANSITION
TBCD	TECHNOLOGY-BASED CURRICULUM DELIVERY
DT	DISSEMINATION TEAM
A&E	ASSESSMENT & EVALUATION

SUCCEED YEAR 7 BUDGET ALLOCATED BY TASK (Period: Sept. 1, 1998 through August 31, 1999)

School	Total	CIT	FD	OA	ST	TBCD	DT	A&E
CLEMSON	$ 256,017	$ 142,875	$ 15,498	$ 36,000	$ 39,644	$ 22,000	$ -	$ -
FAMU	$ 77,297	$ 67,500	$ -	$ -	$ 9,797	$ -	$ -	$ -
FSU	$ 110,500	$ 67,500	$ 11,500	$ 7,000	$ -	$ 21,500	$ 3,000	$ -
GEORGIA TECH	$ 268,195	195,000	$ 17,000	$ 21,602	$ 12,093	$ 22,500	$ -	$ -
NC A&T	$ 176,000	$ 130,000	$ 9,000	$ 13,500	$ 10,000	$ 13,500	$ -	$ -
NC STATE	$ 616,452	$ 195,000	$ 177,614	$ 22,709	$ 40,976	$ 23,501	$ 8,000	$ 148,652
UNCC	$ 321,365	129,980	$ 9,500	$ 24,360	$ 73,298	$ 12,000	$ 38,227	$ 34,000
VIRGINIA TECH	$ 433,462	$ 195,000	$ 18,500	$ 73,702	$ 12,554	$ 100,027	$ 33,679	$ -
UNIV FLORIDA	$ 336,200	195,000	$ 15,000	$ 28,000	$ 11,656	$ 25,000	$ 40,206	$ 21,338
UF ADMIN.	$ 280,594							
-RESERVE	$ 23,918							
SUB-TOTAL	$ 2,900,000	$ 1,317,855	$ 273,612	$ 226,873	$ 210,018	$ 240,028	$ 123,112	$ 203,990
NSF BUDGET	$ 2,900,000							
Remaining	$ -							

SUCCEED YEAR 7 - BUDGET ALLOCATION STATUS AS OF 5/30/99

SCHOOL	Task	PI	Aporoved NSF Funds	Match
Clemson	CIT Coord	Melsheimer	$ 12,875	$ 11,882
	CIT Team	Melsheimer	$ 130,000	$ 447,434
	FD	Hirt	$ 15,498	$ 9,664
	OA	Leonard/Nault	$ 36,000	$ 38,285
	ST	Sill	$ 39,644	$ 10,922
	TBCD	Page	$ 22,000	$ 22,000
		s/t	$ 256,017	$ 540,187
FAMU	CIT Team	Awoniyi	$ 67,500	$ 67,500
	ST	Nnaji	$ 9,797	$ 9,797
			$ 77,297	$ 77,297
FSU	CIT Team	Awoniyi	$ 67,500	$ 67,500
	FD	Buzyna	$ 11,500	$ 11,500
	OA	Tim Beard	$ 7,000	$ 7,000
	DT	Shih	$ 3,000	$ 3,000
	TBCD	Ritzenthaler	$ 21,500	$ 21,500
			$ 110,500	$ 110,500
Ga Tech	CIT Team	Lohmann	$ 195,000	$ 136,569
	FD	Baker	$ 17,000	$ 17,000
	OA	Marr/Hoey	$ 21,602	$ 21,602
	ST	Moore	$ 12,093	$ 12,093
	TBCD	McClellan	$ 22,500	$ 22,500
			$ 268,195	$ 209,764
NC A&T	CIT Team	Cheek	$ 130,000	$ 185,500
	FD	murray	$ 9,000	$ -
	OA	Sarin	$ 13,500	$ -
	ST	Cheek/freeman	$ 10,000	$ -
	TBCD	Kelly	$ 13,500	$ -
			$ 176,000	$ 185,500
NC State	CIT Team	Rajala	$ 195,000	$ 262,594
	FD	Brent/Felder	$ 177,614	$ 34,438
	OA	O'Neal	$ 22,709	$ 17,362
	ST	Ollis	$ 40,976	$ 16,585
	TBCD	Miller/Brawner	$ 23,501	$ 23,620
	DT	Ollis	$ 8,000	$ -
	A&E	Zorowski	$ 148,652	$ 43,111
			$ 616,452	$ 397,710

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SUCCEED YEAR 7 - BUDGET ALLOCATION STATUS AS OF 5/30/99

SCHOOL	Task	PI	Approved NSF	Match
UNCC	CIT Team	Coleman	$ 129,980	$ 202,670
	DT-CST LDR.	Coleman	$ 56,227	$ -
	FD	Maldd	$ 9,500	$ 9,501
	OA	Shelnutt	$ 24,360	$ 7,247
	ST	Phillips	$ 68,310	$ 68,311
	ST	Tolley	$ 7,988	$ 7,990
	TBCD	Price	$ 12,000	$ 12,001
	DT	Phillips	$ 10,000	$ -
	DT	Denshvar	$ 3,000	$ 3,000
			$ 321,365	$ 310,720
Va Tech	CIT Team	Holzer	$ 195,000	$ 328,599
	FD	Holzer	$ 18,500	$ 18,500
	OA	Kurstedt	$ 59,702	$ 51,097
	OA	Muffo	$ 14,000	$ 8,923
	ST	Watford	$ 12,554	$ 13,701
	TBCD	Tront/Lockhart	$ 69,027	$ 69,643
	TBCD	Midkiff	$ 31,000	$ -
	DT	Tront	$ 29,701	$ 26,770
	DT	Hendricks	$ 3,978	$ 5,065
			$ 433,462	$ 522,298
UF	Admin	Anderson	$ 280,594	$ 210,501
	CIT Team	Latchman	$ 195,000	$ 510,938
	FD	Glagola	$ 15,000	$ 10,000
	OA	Elzinga	$ 14,000	$ 14,000
	OA	Legg	$ 14,000	$ -
	ST	Jones	$ 11,656	$ 11,656
	TBCD	Latchman	$ 25,000	$ 25,000
	DT	Holt	$ 26,606	$ 26,606
	DT	Latchman	$ 3,000	$ 3,000
	DT	Chynoweth	$ 3,600	$ 1,882
	DT	Kirmse	$ 4,000	$ 4,000
	DT	Tufekci	$ 3,000	$ 3,000
	A&E	Ohland	$ 21,338	$ 21,338
		UF S/T	$ 616,794	$ 841,921

		Percent Allocated	Total Matching
TOTAL ALLOCATED	$ 2,876,082	99%	$ 3,195,897
RESERVE	$ 23,918		
TOTAL NSF BUDGET	$ 2,900,000		110%

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SUCCEED YEAR 7 (Period Sept. 1, 1998 through August 31, 1999)

FUNDS OBLIGATED / UNOBLIGATED

OBLIGATED		
SUBCONTRACTS - TEAMS FUNDING	$	2,259,288
UNIVERSITY OF FLORIDA TEAMS	$	336,200
UNIVERSITY OF FLORIDA ADMIN	$	280,594
	$	2,876,082
UNOBLIGATED	$	-
RESERVE	$	23,918
TOTAL NSF FUNDS AWARDED YEAR 7	$	**2,900,000**

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SUCCEED YEAR 7 (PERIOD Sept. 1, 1998 through August 31, 1999)

MATCHING FUNDS

SCHOOL	TOTAL FUNDS ALLOCATED	MATCHING FUNDS
CLEMSON	$ 256,017	$ 540,187
FAMU	$ 77,297	$ 77,297
FSU	$ 110,500	$ 110,500
GEORGIA TECH	$ 268,195	$ 209,764
NC A & T	$ 176,000	$ 185,500
NC STATE	$ 616,452	$ 397,710
UNIV FLORIDA	$ 616,794	$ 841,921
UNCC	$ 321,365	$ 310,720
VIRGINIA TECH	$ 433,462	$ 522,298
TOTAL	$ 2,876,082	$ 3,195,897

YEAR 8

SUMMARY PROPOSAL BUDGET

FOR NSF USE ONLY

ORGANIZATION	PROPOSAL N	DURATION (MONTHS)	
UNIVERSITY OF FLORIDA (1st Increment)		Proposed	Granted
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR	AWARD NO.		
DR. TIMOTHY J. ANDERSON			

A SENIOR PERSONNEL: PI/PD, Co-PIs, Faculty & Other Senior Associates (List each seperately with title; A.6. show number in brackets)	SUCCEED Funded Person-mos. CAL	ACAD	SUMR	SUCCEED Funds Requested By Proposer	Funds Granted By NSF (IF DIFFERENT
1 T. J. ANDERSON - DIRECTOR	2.46	0	0	29,265	$ 0
2 M. I. HOIT - ASSOCIATE DIRECTOR	0	1.6	0	14,104	0
3 H. LATCHMAN - INVESTIGATOR	0	0.19	0	1,722	0
4	0	0	0	0	0
5	0	0	0	0	0
6 ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)	0	0	0	0	0
7 ( ) TOTAL SENIOR PERSONNEL (1-5)	2.46	1.79	0	45091	0
B OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1 ( ) POST-DOCTORAL ASSOCIATES	9.8	0	0	33,174	0
2 ( ) OTHER PROFESSIONALS	0	0	0	0	0
3 ( ) GRADUATE STUDENTS				48,740	0
4 ( ) UNDERGRADUATE STUDENTS				0	0
5 ( ) SECRETARIAL-CLERICAL	9.8			18,040	0
6 ( ) OTHER (Res. Coord.) + Mentors/Tutors	9.8			45,100	0
TOTAL SALARIES AND WAGES(A+B)				188,145	0
C FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)25% of A.7,B.2,B.5 +res. Coord /$363/mm health				43,321	0
TOTAL SALARIES, WAGES AND FRINGE BENEFITS				231,466	0
D PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $1,000)					
TOTAL PERMANENT EQUIPMENT Funds Requested from NSF				4,100	0
E TRAVEL 1 DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				32,800	0
2 FOREIGN (ICEE)				3,280	0
F PARTICIPANT SUPPORT COSTS					
1 STIPENDS $ 0					
2 TRAVEL 0					
3 SUBSISTENCE 0					
(0) TOTAL PARTICIPANT COSTS				0	0
G OTHER DIRECT COSTS					
1 MATERIALS AND SUPPLIES				11,154	0
2 PUBLICATION COSTS / Documentation / Dissemination / Final reporting costs				8,610	0
3 CONSULTANT SERVICES				0	0
4 COMPUTER (ADPE) SERVICES				0	0
5 SUBCONTRACTS				1,593,460	0
6 OTHER (INCL FOOD COSTS $2,000, Tuition $4,077)				23,865	0
TOTAL OTHER DIRECT COSTS				1,637,089	0
H TOTAL DIRECT COSTS (A THROUGH G)				1,908,735	0
I INDIRECT COSTS (SPECIFY RATE AND BASE) 46% MTDC					
TOTAL INDIRECT COSTS				141,265	0
J TOTAL DIRECT AND INDIRECT COSTS (H+I)				2,050,000	0
K RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPM 252 AND 253)				0	
L AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 2,050,000	$ 0

M COST SHARING: PROPOSED LE 2,050,000	AGREED LEVEL IF DIFFERENT $	
PI/PD TYPED NAME & SIGNATURE* Dr Timothy Anderson- Timothy J Anderson	DATE 5/28/99	FOR NSF USE ONLY
		INDIRECT COST RATE VERIFICATION
INST REP TYPED NAME & SIGNATURE*	DATE	Date Checked / Date of Rate Sheet / Initials-DGC

SUMMARY PROPOSAL BUDGET

YEAR 8

FOR NSF USE ONLY

ORGANIZATION	PROPOSAL NO.	DURATION (MONTHS) Proposed	Granted
UNIVERSITY OF FLORIDA (2nd Increment)			
PRINCIPAL INVESTIGATOR/PROJECT DIRECTOR	AWARD NO.		
DR. TIMOTHY J. ANDERSON			

A SENIOR PERSONNEL: PI/PD, Co-PIs, Faculty & Other Senior Associates (List each seperately with title; A.6. show number in brackets)	SUCCEED Funded Person-mos. CAL	ACAD	SUMR	SUCCEED Funds Requested By Proposer	Funds Granted By NSF (IF DIFFERENT
1 T. J. ANDERSON - DIRECTOR	0.54	0	0	6,424	$ 0
2 M. I. HOIT - ASSOCIATE DIRECTOR	0	0.36	0	3,096	0
3 H. LATCHMAN - INVESTIGATOR	0	0.04	0	378	0
4	0	0	0	0	0
5	0	0	0	0	0
6 ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET EXPLANATION PAGE)	0	0	0	0	0
7 ( ) TOTAL SENIOR PERSONNEL (1-5)	0.54	0.4	0	9898	0
B OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1 ( ) POST-DOCTORAL ASSOCIATES	2.2	0	0	7,282	0
2 ( ) OTHER PROFESSIONALS	0	0	0	0	0
3 ( ) GRADUATE STUDENTS				10,260	0
4 ( ) UNDERGRADUATE STUDENTS				0	0
5 ( ) SECRETARIAL-CLERICAL	2.2			3,960	0
6 ( ) OTHER (Res. Coord.) + Mentors/Tutors	2.2			9,900	0
TOTAL SALARIES AND WAGES(A+B)				41,300	0
C FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) 25% of A.7,8.2,8.5 +res. Coord /$363/mm health				9,510	0
TOTAL SALARIES, WAGES AND FRINGE BENEFITS				50,810	0
D PERMANENT EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $1,000)					
TOTAL PERMANENT EQUIPMENT Funds Requested from NSF				900	0
E TRAVEL 1. DOMESTIC (INCL. CANADA AND U.S. POSSESSIONS)				7,200	0
2 FOREIGN . (ICEE)				720	0
F PARTICIPANT SUPPORT COSTS					
1 STIPENDS $ 0					
2 TRAVEL 0					
3 SUBSISTENCE 0					
(0) TOTAL PARTICIPANT COSTS				0	0
G OTHER DIRECT COSTS					
1 MATERIALS AND SUPPLIES				2,448	0
2 PUBLICATION COSTS / Documentation / Dissemination / Final reporting costs				1,892	0
3 CONSULTANT SERVICES				0	0
4 COMPUTER (ADPE) SERVICES				0	0
5 SUBCONTRACTS				349,784	0
6 OTHER (INCL FOOD COSTS $2,000, Tuition $915)				5,244	0
TOTAL OTHER DIRECT COSTS				359,368	0
H TOTAL DIRECT COSTS (A THROUGH G)				418,998	0
I INDIRECT COSTS (SPECIFY RATE AND BASE) 46% MTDC					
TOTAL INDIRECT COSTS				31,002	0
J TOTAL DIRECT AND INDIRECT COSTS (H+I)				450,000	0
K RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPM 252 AND 253)				0	
L AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				$ 450,000	$ 0

COST SHARING: PROPOSED LEV 450,000 AGREED LEVEL IF DIFFERENT $

PI/PD TYPED NAME & SIGNATURE*	DATE	FOR NSF USE ONLY
Dr Timothy Anderson- Timothy J Anderson	5/28/99	INDIRECT COST RATE VERIFICATION
INST REP TYPED NAME & SIGNATURE*	DATE	Date Checked / Date of Rate Sheet / Initials-DGC

Appendix I. Engineering Enrollment and BS Degree Statistics

The longitudinal study of women and minority undergraduate engineering enrollment and BS degrees awarded by SUCCEED schools compared with the remaining engineering schools in the country has been updated using the national statistics published by the American Association of Engineering Societies. Shown in the table below are the latest results of this study with undergraduate enrollment figures through 1997 and BS degrees awarded through 1998 compared to figures from the 1989 base year. The Adjusted National entries represent total national statistics not including data from the SUCCEED institutions.

Comparison of SUCCEED to Adjusted National*
Engineering Enrollment and BS Degrees Awarded Statistics

Enrollment (1989-1997)

	% increase in SUCCEED	Percent of all SUCCEED	% Increase in Adjusted National	Percent of all Adjusted National
African American	40%	15%	13%	6%
Hispanic	59%	3%	54%	9%
Native American	152%	0.46%	78%	0.68%
Women	20%	22%	18%	20%

BS Degrees Awarded (1990-1998)

	% increase in SUCCEED	Percent of all SUCCEED	% Increase in Adjusted National	Percent of all Adjusted National
All Students	13%	N/A	-2%	N/A
All Minorities	84%	17%	66%	11%
Women	41%	21%	29%	18%

* - Adjusted National (all U.S. Colleges minus SUCCEED Schools)

The enrollment results give the percentage increase in total numbers since 1989 and the current percent of the total enrollment by classification group listed. The "BS degrees awarded" figures show the percentage increase in degrees awarded institutions to all students, minorities (considered in this study to be African American, Hispanic and Native American graduates), and women since 1989 for SUCCEED and non-SUCCEED engineering schools. These statistics have been adjusted for changes in total enrollment and degrees awarded using 1989 as a base year.

It is observed that in every category, with the exception of percentage of total enrollment of Hispanic and Native American students, SUCCEED's performance exceeds that of the rest of the nation. As envious as this performance appears, there is one particular trend that has become apparent over the past several years that cautions against complacency both for the Coalition and the remainder of the country. The dramatic increases in African American enrollments experienced through 1994 have now leveled off for both SUCCEED and the National figures. The Coalition's enrollment of African American students topped out at about 15-16% of total enrollment and have remained at that level since 1994 while the Adjusted National percent of total enrollment has remained constant at 7% since 1992.

In contrast, enrollment of women students as a percentage of total enrollment has increased steadily from 18% to 22% from 1989 for SUCCEED schools and from 16% to 20% over the same period for the remainder of the country. Native American student enrollment in SUCCEED institutions has increased in percentage of the total enrollment by 140% while the Adjusted National figure for the same statistic is 80%. Native American students, however, make up only two-thirds of one percent of the total national enrollment and not quite one-half percent of the total SUCCEED enrollment. Hispanic student enrollment is the second fastest growing category, now making up 3% of total SUCCEED enrollment and 8% of adjusted national enrollment.

Over the past three years, the percentage of total BS engineering degrees awarded to minorities and women have both remained about constant at the figures shown in the table for both SUCCEED and the remainder of the country.

Appendix II. Glossary of Acronyms

SUCCEED	Southeastern University and College Coalition for Engineering Education

SUCCEED's institutions

Ga Tech, Georgia Tech, GT	Georgia Institute of Technology
FAMU	Florida A&M University
FSU	Florida State University
NCAT, NC A&T	North Carolina A&T State University
NC State, NCSU	North Carolina State University
UF	University of Florida
UNC C, UNCC, UNC-C	University of North Carolina at Charlotte
Va Tech, Virginia Tech, VT	Virginia Polytechnic Institute and State University

SUCCEED personnel and affiliates

CFT	Coalition Focus Team
CIT	Campus Implementation Team
CST	Coalition Service Team
COS	Council of Schools
PI	Principal Investigator
EAB	External Advisory Board

SUCCEED focus areas

FD	Faculty Development
OA	Outcomes Assessment
ST	Student Transitions
TBCD	Technology-Based Curriculum Delivery

SUCCEED Council of Schools members

MSU	Mississippi State University
MTU	Michigan Technological University
SJSU	San Jose State University
UCF	University of Central Florida

Organizations, administrative units, and conferences

AAES	American Association of Engineering Societies
ABET	Accreditation Board for Engineering and Technology
ASEE	American Society of Engineering Education
EC 2000	Engineering Criteria 2000
CES	College of Engineering and Science (at Clemson)
COE	College of Engineering
FIE	Frontiers in Education Conference
ICEE	International Conference on Engineering Education
NSF	National Science Foundation